

## Best practice for Ultra Low Sulphur Diesel

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### Introduction

Modern engines complying with the latest emission regulations are equipped with high technology precision fuel injection components. Injection pumps and injectors are designed to offer the best performance and service life to be expected by any engine manufacturer and by all engine end-users, on condition that they work with good quality and clean fuel.

The fuel injection components represent a significant proportion of the engine value since they are manufactured to manufacturing tolerances as fine as 1 micron (= one thousandth of a millimeter). The latest technology high pressure common rail (HPCR) systems work at pressures up to 1,500 Bar (21,750 Psi). In all diesel fuel injection systems the components are lubricated by the fuel.

Small components and very high pressures mean it is vital to keep fuel clean. Best practice recommendations for storing and handling fuel to prevent contamination must be adhered to. Contamination with water must also be avoided to prevent corrosion and possible seizure of the components in the fuel injection system.

Good quality diesel fuel is designed to lubricate the fuel injection system components. However, depending on deliveries and/or storage conditions, wide variation exists in diesel fuel quality. Low quality fuel delivered to your bulk fuel tank means you need to take additional action. The use of the appropriate fuel additive will help to improve the quality of the fuel and protect the fuel injection components on your equipment.

### Ultra Low Sulphur Diesel (ULSD)

Since 1 January 2011 the fuel for all off-road machinery (red diesel in the UK, green diesel in Ireland) should be ultra low sulphur diesel (ULSD). This is an EU requirement for Stage IIIB emission compliant engines.

ULSD contains no more than 10 milligrams of sulphur per kilogram of fuel.



### Fuel specification

In the UK there are two standards for ULSD:-

## BS2869

This is based on the former red diesel but with the sulphur removed.

## EN590

EN590 is the specification for road fuel. A fuel duty marker dye will be added.

Fuel specification of ULSD is important. John Deere recommends use of ULSD to EN590 since the cetane number is higher.

The cetane number is a measure of the ignition delay. The higher the number the faster and therefore more complete the combustion process is. A lower cetane fuel has a longer delay and can leave deposits within the combustion chamber and injector nozzle tips, thus reducing engine performance and fuel efficiency.

Always buy from a reputable supplier. Ask about the specification of the fuel you are buying.

### Fuel handling best practice

Fuel storage tanks should be in sound condition and bunded according to local fuel storage recommendations. Particular attention should be paid to bowzers used to transport fuel to the field – use of old 5 gallon drums is more likely to lead to contamination (as well as a bad back).

[Click here](#) for information about products that can help to protect your fuel and your machinery.



### Fuel treatments



*John Deere Fuel-Protect Keep Clean*



*Performance Formula*



*John Deere Diesel Fuel System Clean-up*



*John Deere BioDiesel Protect 100*

John Deere invests heavily to investigate and develop fuel treatment products. Thanks to extensive testing in research laboratories and in the field, we are delighted to offer a range of fuel

treatment products designed to protect the fuel components on your machinery and to help recover performance and fuel economy.

Even with ULSD of the higher EN590 specification, it may still be necessary to use a fuel treatment. More detail is shown below or ask your John Deere dealer for advice.

Click the links below for detail on the individual products.

<a href="#">John Deere Fuel-Protect Keep Clean</a>	John Deere Fuel-Protect Keep Clean solution for diesel injectors is a maintenance additive to be used over the life of the engine.
<a href="#">Performance Formula</a>	Performance Formula, All season Diesel Fuel Additive, tackles problems related to low quality diesel fuel.
<a href="#">John Deere BioDiesel Protect 100</a>	Biodiesel Protect 100 is a high performance diesel fuel injection system cleaner specifically designed to prevent and remove injector deposits caused by biodiesel.

### John Deere Diesel Fuel System Clean-up

After following appropriate diagnostic procedures to rule out other potential causes, your dealer technician may determine that symptoms are a direct result of deposits left on the fuel injectors causing poor combustion. Diesel Fuel System Clean-up solution, along with the Fuel Injector Flush Tool, is the recommended service solution for these fuel related engine performance issues.

This clean-up service must be performed by your John Deere dealer.



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